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PALESTINE REFUGEE PROBLEM

Irrigation Finance

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Irrigation Wealth and its Taxation

As the result of the control of the natural flow of the rivers and the use of their water for irrigation, riverain agricultural land and urban areas are protected from devastating floods; barren desert is turned into culturable land; swamps are reclaimed and become productive. Areas, where rainfall is scanty, which are not completely barren yield additional crops when brought under irrigation. In each case irrigation results in the production of new or additional crops of considerable annual value, also in a large increase in the value of the lands themselves.

The works that are required for flood control; for storage to increase the irrigation supplies; for the drainage of the swamps; and the barrages, canals and regulators which are required for the distribution of the water, cost large sums of money and it is obvious that this money should be obtained from the increased value of the land, and from the produce of the land created by these works. The question is how can this best be done.

Productivity

In the first place it will be advisable to lay down a few principles, and the first of these is that irrigation should be productive or at least shall not be run at a loss. This means that Government should obtain from its irrigation system sufficient revenue to balance the cost of running the system, which includes in addition to the actual cost of operation and maintenance of the storage works, regulators, canals, drains etc., the meeting of the interest charges on the sum at charge resulting from the capital expenditure involved. If the revenue exceeds the running costs, no harm results. The surplus can be used either to reduce the sum at charge, or to increase the country's general revenues.

Sum at Charge

If properly financed, irrigation development will ultimately

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be paid for from the proceeds of the sale of the produce of the developed lands. There will, however, inevitably be a long interval, between the expenditure incurred in the development and the realization of the revenue. Capital is, therefore, required to bridge this gap, and this will generally be obtained from loans on which interest charges are involved. These interest charges must themselves be met from capital until they can be met from revenue, and consequently the sum at charge increases until revenue receipts equal or exceed the interest charges plus working expenses. The sum at charge on a Project at any time is the expenditure incurred to date plus the accumulated interest charges thereon less any revenue allocated to the reduction of capital.

Land Value

The first revenue that will become available to any project is generally to be obtained from the increased value of the land to be served, and the second general principle which must be stated is that the whole of this should be impounded and used for the reduction of the sum at charge. Land coming under development may be in the absolute possession of Government, may be in the possession of Government but subject to rights of private individuals of varying degrees, or may be in the complete possession of private individuals. When Government has full rights in the land, the land can be sold in the open market, and the proceeds credited to the Project. When private individuals have rights in the land, or the land is privately owned, compensation can be paid for their rights, or the land can be acquired at pre-development valuation, and its full value similarly realized. Alternatively, the full value can be obtained by renting or by taxation equivalent to the interest charges on the estimated increase in value at current rates. Preferably, however, a system whereby Government obtains the full amount of the increased land value and the occupier full ownership is to be performed. When this cannot be paid outright payment can be arranged by instalments spread over a reasonable period. With interest at 3½% the rent required to pay off capital in 20 years is 7.03% i.e., and annual payment of 500 fils per meshara would pay off a capital expenditure of ID 7.100 per meshara in twenty years.

Approximate Cost of Irrigation and Increase in Land Values.

In a separate Note outlining a tentative plan for the full development of irrigation in Iraq, the total cost of development of

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the country has been approximately estimated at ID 115,035,000 made up as below:

(a)	Flood Control and Storage	ID 27,375,000
(b)	Irrigation	36,610,000
(c)	Drainage	40,200,000
(d)	Power	7,850,000
(e)	Navigation	3,000,000
	Total	ID 115,035,000

Of (a) above the benefits of flood control will chiefly be felt in the riverain areas at present under lift irrigation, and in riverain urban areas, while those of storage will go largely to area to be newly developed. (b) Irrigation will exclusively benefit new areas, while (c) will benefit new and old flow areas alike. It is suggested that (c), (d) and (e) should be financed independently, and that in view of its dual purpose, half of (a) should be considered flood control expenditure, and its finance considered separately while the balance should be considered a charge against the development areas. The total new area which will be given irrigation under this plan is 14,600,000 mesharas gross of which 85% or 12,400,000 mesharas may be assumed to be culturable. The total cost of storage and irrigation of these areas may be taken as:

Storage	ID 13,687,000
Irrigation	ID 36,610,000
Total	ID 50,297,000

or ID 4.06 per meshara culturable. If we assume the average development project to take three years for construction during which the expenditure would be 30, 40 and 30% of the whole, interest charges at 3½% at the end of construction would amount to 6.8%. Hence the rate of the sum at charge per meshara would be 4.33. If we allow five years for the establishment of the full value of the land, after construction is completed, the sum at charge becomes 5.1. ID 5.1 per meshara would be a low value of irrigated agricultural land at the present time and hence it would seem that the capital cost of development including flood control and storage could be covered completely by the increase in land value.

It is unlikely, however, that the increase of land value in all cases will in practice provide sufficient capital for the cost of works. The above figures are only approximations to the average and in individual cases the cost of construction will be higher. A possibility in this connection of course is to allocate the profits of one project to balance the losses on another. Irrigation

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provides many indirect benefits which justify small losses in individual Projects. Again land values are bound to be depressed by the placing of large areas on the market; also present prices are inflated as the result of war conditions and a fall may be anticipated in the future, factors which may make it difficult to realize capital from land.

Running Costs to be met from Value of Produce.

If the whole capital cost of development cannot be met by realization of the increase in land values, interest charges on the balance must be added to the operating costs and revenue must be secured to cover the total. In this connection two further principles may be stated. These are that if the irrigation system is to be run in the best interests of public, the revenue should be sufficient to cover a high standard of maintenance, and should provide a small margin of profit only, which would of course be credited to general revenue. In particular Government should assume complete responsibility for the maintenance of canals and embankments and should not leave this in part to the cultivators as is done at present. There is, however, a limit to the revenue which can equitably be obtained from irrigation and this it is thought might be taken as about 10% of the value of the produce of the lands.

Running Costs.

If we assume that only 75% of the capital cost of development is realized from the increase of land values assumed above, the interest charges on the balance of the sum at charge, five years after completion of construction would amount, at 3.1/2% to 45 fils per meshara of cultivable land per annum. Running costs may amount to 55 fils making the total revenue required about 100 fils per meshara.

Actual figures of the cost of maintenance of open canals in Iraq at the present time are much less than 55 fils per meshara culturable, being about 30 fils, including all Establishment charges, in the case of canals controlled throughout by the Irrigation Department. The present standard of maintenance, is not, however, considered satisfactory and requires to be improved. Much of the silt clearance of channels is done by the cultivators themselves

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which should be the responsibility of Government. In view of the above a figure of 55 fils for maintenance does not appear unreasonable.

Value of Produce.

If we take the average value of the produce of a meshara of cultivation as ID. 5/- at present day rates and assume 60% of the culturable area to be sown annually, the value of the produce of a meshara of culturable land per annum would be ID 3.0. Assuming that one tenth of this is secured to Government by some form of taxation, the revenue would be 300 fils. This exceeds the amount required, but it must be remembered that it is based on the inflated rates of the present time. These rates and consequently the taxable value of the produce are likely to fall in the future to an extent which cannot be predicted. In view of this, it might be advisable, if interest charges are included in the expenses to be met, to base the assessment on present values and to use the surplus above interest charges and working expenses to pay off capital and hence reduce the interest charges. If interest charges are not included this is not so important, as running and maintenance costs will themselves fluctuate to some extent in sympathy with market rates.

Finance of Drainage in Old Areas.

In the tentative plan for the development of irrigation in the country, drainage has been included for the whole of the old flow area and of the development area. Experience of irrigated areas in Iraq indicates that the majority depreciates rapidly owing to water-logging and salinization of the land. Some areas go out of cultivation completely and in others the productivity falls off to a greater or less extent. In view of this, it is arguable that drainage should always be provided at the time when irrigation is introduced. However, it is very difficult to predict beforehand in what areas drainage will be necessary. Some areas may not deteriorate at all and in others, deterioration may be very slight and productivity remains at such a high level as not to require reclamation by drainage. In view of this, and of the fact that drainage can be introducted at any time, while it is advisable to plan a drainage system when introducing irrigation to an area, it

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would seem advisable to postpone its actual construction until the necessity has been established. The cost of drainage has been estimated at ID 2.00 per meshara gross or ID 2.36 per meshara culturable. Allowing two years for construction of a drainage project with 50% expenditure each year the sum at charge at the end of construction would be ID 2.48 per meshara. Assuming that taxation does not take effect until the taxable values have come into existence, say three years after completion of the drains, the sum at charge would become ID 2.75 per meshara culturable. Interest charges on this at 3.1/2% would amount to 96 fils. Running expenses might amount to 50 fils and the revenue required would thus be about 150 fils.

Drainage will of course increase the value of the land, the amount of the increase depending on its condition prior to drainage. As the old areas will generally be privately owned, realization of this increase in land value would take the form of a tax on the culturable area. The maximum increase of land value i.e., in the case of the reclamation of useless land would amount to the full value of good agricultural land say about ID 8,000 per meshara, interest, on which would amount to fils 280. When such land is reclaimed also one tenth of the full value of the produce would be claimable as taxes, i.e., fils 300 per annum, i.e., a total revenue of fils 580. Drainage Schemes will, however, generally cover areas which are only partially deteriorated and in such cases while the cost of drainage will remain about the same, the benefits will be proportional to the extent of the deterioration. From the above it would appear that with present prices drainage schemes might be undertaken productively in areas which are producing less than 75% of normal. Taxation in drainage areas will of course partially be realized automatically through the Istihlak tax on the increased produce. In view of this it seems probable that a general drainage tax of 100 fils a meshara per annum on the culturable area should suffice to make drainage construction productive. In individual schemes there may be losses but in general this should suffice.

Finance of Electric Power.

In the note on the tentative plan for the full development of the country, it has been shown that the cost of hydroelectric installations will vary from 50 to 90 Dinars per K.W. installed and that at these rates it should be possible to deliver power at a suitable market at from 1.6 to 2.0 fils per unit. Such power

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should be readily saleable, and consequently the power projects productive.

Finance of Navigation.

In order that Navigation expenditure may be productive, some taxation of river transport will be necessary and this would probably take the form of a surcharge on freight rates. Details of this can only be worked out after the works required have been estimated in detail, and when figures are available of the river traffic concerned.

Assessment Systems.

Irrigation revenue may be assessed in various ways. Whatever system is used it is desirable that it should be simple and not present too many opportunities for abuse. It should also adjust itself automatically to changes in taxable values, or at least be readily adjustable, in order that it may bear as lightly as possible on the cultivator. Among the assessment systems in use the following may be considered:

(a) Assessment on water used.
(b) Assessment on culturable area.
(c) Assessment on cultivated area.
(d) Assessment on produce.

(a) Assessment on Water Used.

In this system the cultivator pays for the water used at a fixed rate per unit of volume. The advantage claimed for it is that it tends to economy in the use of water. It involves the installation of meters on the source of supply of each holding and organization for reading those meters, billing the cultivators and collecting revenue. In actual practice the economy claimed is not secured to any high degree; the reason being that a canal system cannot be operated to meet rapid fluctuations of demand, and water not used must frequently be wasted. The system lends itself readily to abuse. It has its uses for special cases, but is not suitable for general application in this country.

(b) Assessment on Culturable Area.

In this case the revenue is assessed at a rate per unit of

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culturable area, a condition of the assessment being that the area is given a source of water supply adequate to the area. The rate may be varied from time to time in accordance with fluctuation in market rates of agricultural produce. It may also be varied with the type of cultivation, the quality of the land and the magnitude of the water supply, though this is not desirable unless such departures from the normal can be shown with certainty to produce a market variation in the value of the produce.

The relation between taxation and water supply is of great importance. If the condition that construction of the water supply is dependent on the payment of taxation is enforced, collection of the revenue will be greatly facilitated.

It is a simple and efficient system of assessment commonly used in India in conjunction with (c).

(c) Assessment on Cultivated Area.

In this case the assessment is on the area actually irrigated at rates varying with the crop grown. Remissions may be given in the case of crop failure. The system is complicated requiring surveys of the whole of the culturable area at least twice during each crop. It lends itself readily to abuse. The advantage is that the revenue is closely proportional to the value of the produce and hence to the ability of the cultivators to pay. With this system statistics of crop areas are readily obtainable. The system is widely used in India.

(d) Assessment on Produce.

In this case the assessment takes the form of a percentage of the price obtained by the sale of the produce. This is a simple form of assessment which is in general use in Iraq as the Istihlak Tax. Objection to it has been raised on the grounds that it makes no distinction between produce of irrigated or unirrigated lands, or between flow and lift irrigation, the latter being privately operated and receiving no benefits in exchange for the payment. Actually pump irrigation receives considerable benefit from flood embankments and will in the future benefit from the flood control and storage works. There is little object, therefore, in discriminating in its favour. Irrigated and unirrigated produce rarely come

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to the same market, and there is no reason why the tax should not be varied by markets in favour of the unirrigated produce. The Istihlak Tax fluctuates automatically, thus giving the greatest return to Government and bearing least hardly on the cultivator. A disadvantage is that the tax can in practice only be applied to produce coming to market and hence produce used for domestic purposes, such as grain ground at home, fodder for cattle, or produce sold to neighbours escapes the tax. Produce used in this way, however, can be considered part of the farmer's working expenses, taxation of which is not advisable. The fact that a proportion of the produce does not come to market may be circumvented, however, by a proportionate increase in the tax.

Suitability of different systems.

The actual proportion of agricultural produce subject to the Istihlak Tax is a matter of great importance when the use of the tax for the collection of revenue is under consideration. Enquiries have been made regarding this, and the results to date indicate that the proportion is about 33%. To realize one tenth of the value of the crop on this proportion would mean taxation at the rate of 30% which seems undesirably high. It would, it is thought, be preferable to limit the Istihlak Tax rate to about 15% thus realizing about 5% of the value, and to obtain the balance of 5% from a tax on the culturable area, the rate of which at the values assumed above would have to be 150 fils per moshara. As the rate represents a proportion of the value of the produce of the land it should be varied during the development period accordingly, say 15 fils the first year, 24 the 2nd., and so on attaining to 150 fils in the 10th year only. The rate would, however, be varied annually in proportion of produce during the previous year.

With present values, taxation on these lines would provide a considerable profit to Government, and in view of the probability of falling values it would seem advisable that this profit should be secured and used to build up a reserve against future eventualities. It is satisfactory to be able to note that these eventualities would not be without limitation since a large fall in the value of produce will certainly be followed also by a fall of construction costs permitting the later portion of the development program to be carried out more economically.

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Flood Control Finance

The above appreciation indicates what is considered the best way of financing irrigation development in Iraq, i.e, meeting the capital expenditure as far as possible by sequestration of the resulting increase of land values, and running expenses plus the servicing of any balance of capital expenditure from taxation of the produce of the land, either through the Istihlak tax or a rate on the culturable areas served. A point which requires special consideration, however, is the financing of flood control. While flood control schemes will generally be combined with storage, thus making development of irrigation possible, the revenue from this source will in general not be available for many years after the flood control expenditure is incurred, and in the meantime the servicing of the capital expenditure involved has to be arranged. The flood control works included in the first stage development proposed, for instance, will involve expenditure of ID 11,500,000, of which ID 7,000,000 for the Wadi Tharthar is entirely for flood control. If half the balance is debited to storage, the total flood control expenditure would be ID 9,225,000 the interest charges on which at 3.1/2% would amount to ID 324,000 per annum.

Increase of Land Values from Flood Control

As I have previously suggested the establishment of flood control will permit the restriction of the river bed throughout its course, thus allowing the reclamation of considerable land areas. This reclamation will be expensive, involving as it does the advancing of the river banks and the raising of the area between, probably by dredging from the river. This expenditure may be of the order of 100 fils per square metre, and would not be justified in the case of land intended for agriculture. In urban areas and more particularly in the city of Baghdad such reclamation would, however, be justified for building sites. It is calculated that after allowing space for roads, etc., about 1,000,000 metres could be made available in this way between Kadhimain and Karkha and obviously if this could be sold at an average rate of ID 9.225 per square metre, the capital required could be obtained. Rates very considerably in excess of this figure are being obtained for building land in Baghdad, but of course, the value of the land varies in accordance with its distance from the centre of the city. On the

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On the average it is probable that a price of ID 5-000 a metre could be obtained at the present times and consequently the balance of the capital required would be reduced to ID 4,225,000, interest charges on which would amount to ID 148,000 per annum.

Reduction in Present Flood Expenditure

Expenditure on the construction and maintenance of flood embankments in the Irrigation Directorate on the Euphrates and Tigris upstream of Amarah, including establishment charges has been of the order of ID 275,000 per annum since 1943, and much of the construction expenditure is of the nature of maintenance i.e., the replacement of old embankments by new ones. Expenditure at this rate is likely to be continued for many years to come if flood control is not established, but with flood control it could be reduced by at least half. Expenditure on flood operations themselves i.e., the care of the embankments during floods and the repair of flood damage including establishment charges amounts on the average to something like ID 60,000 per annum, which would be almost entirely eliminated by the establishment of flood control. Interest charges could, therefore, very largely be met by the savings on these items.

Taxation of Additional Land Values

From the above it would appear that there is little need for additional revenue to justify financially the execution of the flood control schemes required in the near future. However, the proceeds of the Baghdad land are somewhat problematical. Also they are exhaustible and the savings on flood expenditure also can only be effected once. Any balance of the final stage that may remain and all future flood control expenditure will, therefore, have to be met from taxation of the land and property which will benefit.

The benefits of flood control while very wide spread are somewhat difficult to locate and specify. In years of high floods breaches occur in various parts from which large areas of culturable land are inundated and crops destroyed. Much damage is done to buildings, particularly pump installations. There is some loss of life among the cattle population. In the event of breaches of bunds protecting urban areas, there is damage to buildings, roads and other property. Even without breaches a great deal of damage is done by seepage. Floods interrupt communications throughout the country, and do much damage to roads and railways, and increase the

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cost of constructing and maintaining bridges and culverts.

In view of the widespread nature of the benefits that are likely to result from flood control, it is suggested that the revenue required to pay for it should also be spread as widely as possible, and the best way of effecting this would seem to be a tax on the culturable area at present irrigated both by lift and flow. At the same time urban areas should bear a share of the taxation which could be arranged by increasing the existing property tax.

If we assume an expenditure of ID 10,000,000 on flood control during the next ten years of which half will be obtained from increased land value and capitalization of reduced flood expenditures, we would require to find ID 5,000,000 from taxation. Let us assume that this is obtained initially by loans, and that these loans should be repaid in twenty years. In this case the annual charge would amount to 7.03% i.e., ID 352,000. The property tax at present 12½% yields about 420,000 per annum throughout the whole country, and in the liwas which flood control would benefit may be taken as ID 350,000 say. A surcharge of 2.1/2% on the tax might be imposed which would bring in about ID 70,000 per annum. The culturable area at present irrigated both by flow and lift is about 9,000,000 nesharas, and the balance of the revenue required i.e., ID 282,000 per annum would be secured by a tax of fils 31 per neshara. This could be secured either as a direct tax on the land, or where land settlement is not yet complete as an increase of say 4% on the Istihlak tax. Taxation on this scale carried on for fifty years would repay the capital expenditure required for the full development of flood control in the country.

Pro Forma Accounts

At the present time the accounts of irrigation projects in Iraq are not kept in such a way as to reveal the efficiency or otherwise of their financial performance. No attempt is made to assess the revenue created by irrigation schemes and to compare this with the cost of their construction and operation. In India for all Major Irrigation Projects pro forma Capital and Revenue Accounts are kept. The former is an account of the capital expenditure on the Project. The second is debited with working expenses and interest charges, and credited with revenue from all sources, water rates, interest on sale proceeds

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structed costs which will also vary considerably over long periods. A limit is imposed on possible taxation also by the value of produce which will vary with local and world market rates. The financial side of irrigation development will require to be kept under observation and suitable variation in taxation rates made from time to time.

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